Premedication in Anæsthesia

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Premedication is one of the most valuable elements in the production of good anæsthesia and is of great psychological importance. Every anæsthetist knows how difficult it is at times to get good relaxation, without deepening the anæsthesia to a dangerous degree; with a suitable narcotic administered one hour before operation, these difficulties should be greatly lessened. There would seem to be several main indications for premedication :—

(1) To render the patient sleepy or sedative before coming into the theatre and to eliminate fear.

(2) To shorten the period of induction, and lessen the amount of general anæsthetic needed, without interfering with the depth of the anæsthesia.

(3) To diminish the amount of mucus secreted, and to try to avoid post-operative vomiting.

(4) To procure a longer period of insensibility to pain.

In the early days when morphia was first used, it was used to deepen the anæsthesia and to prolong the period of insensibility. Later, it was noticed that when morphia was given less anæsthetic was needed. Atropine was added to prevent cardiac inhibition, it also acts as a respiratory stimulant, and so counteracts the depressing effect of morphia, and it inhibits the excessive secretion of mucus caused by ether.

To-day more attention is being paid to the psychological effect of premedication, the very definite influence that the mind has over the body being more fully recognised. This is not altogether a new theory, but a very old one that is becoming better understood. It is probable that the amulets and talismen of the early centuries had a psychological value, for there is evidence that some of the sick got well, without any other aid. At a meeting of the Royal Society of Medicine, Dr. Bernard Hollander was able to show from his own experience and of others, that full surgical anæsthesia could be produced by hypnosis.[1] But this method is not likely to play a large part in the practical administration of anæsthetics, though Dr. Hollander was of the opinion that in certain circumstances hypnosis might replace the preliminary drugs used to procure calm and banish apprehension, and that it might be employed alone or as an aid to induction. One of the elements in the fear induced by the prospect of an anæsthetic, apart altogether from that due to the operation itself, is the fear of the unknown : this is an instinctive fear. Throughout the ages the race has had to be afraid of the unfamiliar and approach it with caution, and in the nervous individual this fear is very much accentuated. In their book, "Outwitting Our Nerves,"[2] Jackson and Salisbury quote from Crile (Origin and Nature of the Emotions) : "We fear not in our viscera alone, fear influences every organ and tissue. . . . Nature has one means of response to fear, and whatever

its cause the phenomena are always the same, always physical." That fear and anxiety do influence every system in our bodies is a common and daily observation of all who practise medicine.

Dr. Crichton-Miller draws attention to the fact that because a patient is a human being his physiological processes are enormously more influenced by emotional factors than is the case with the lower animals, and that this is a fact we must remember when using hypnotic drugs. That though the doses and action have been accurately worked out on animals, there is always the personal factor to deal with, even though physiologists may tell us that the nervous organisation of the higher vertebrates, including man, is based on the same pattern.[3]

The anæsthetist must take his part in the surgical team. The special needs of the patient and the special needs of the operation should be considered, and the best possible combination of drugs for premedication and for maintaining the anæsthesia used. The ideal to be aimed at: that the patient can have confidence, that the anæsthetic will be safe and pleasant, and the after-effects as few as possible. At the same time, the anæsthesia must be such that the surgeon is able to work with the greatest ease possible, the better the relaxation the less damage is done to the tissues, the time of the administration is shortened, and the amount administered is lessened.

The Basal Narcotics are the most recent drugs to be used in premedication, and it is claimed for them that they lessen or eliminate most of the difficulties encountered in anæsthesia. They help to lessen shock by reducing the sensitiveness of the nervous system to painful stimuli, and by eliminating the element of fear. It is also claimed that nausea and vomiting are less after the basal narcotics. Respiratory difficulties are seldom met with when the barbiturates are used; respiratory arrest is more likely to occur when no premedication has been given and the anæsthesia is too light. In abdominal surgery in particular good relaxation is essential, and it is not always easy or even possible to find the cause of resistance: repressed fear is more often the cause than is recognised.

Pre-anæsthetic medication decreases the general body metabolism and lowers the demand of the body tissues for oxygen. The desired level of anæsthesia is more quickly and easily reached with the minimum disturbance of the muscular, respiratory, and circulatory systems. The respiratory excursion is lessened, an advantage especially in upper abdominal surgery, the secretion of mucus is less, and there is a decreased tendency to nausea and post-operative vomiting. Adequate premedication helps to protect the patient from the depressing effect of prolonged or deep anæsthesia and to minimise surgical shock. According to Crile, the exclusion of both traumatic and emotional stimuli will prevent shock. It has been suggested that death during induction may be due to an excessive secretion of adrenalin being poured into the circulation and causing ventricular fibrillation, the excess of adrenalin being due to fear or apprehension. This is an accident most common during induction with chloroform, and can be prevented by giving atropine beforehand and avoiding a strong concentration of chloroform on the mask. I should mention that adrenalin should never be given during a chloroform administration, though it may

be given before the anæsthetic is started. "Reflex" shock can be prevented by good sedation, deep general anæsthesia, or by nerve-blocking. Prolonged fear or anxiety exhausts the sympathetic nervous system, and tends to produce shock and a lowered metabolism.

Mórphia with atropine, omnopon with atropine or scopolamine are probably the most common drugs in use. When scopolamine is given there is much better amnesia, and also atropine is not necessary. Atropine should always be given before the administration of chloroform.

Basal narcosis, a basis of light sleep, safe and pleasant, aims at the comfortable production of unconsciousness and narcosis deep enough to allow surgical anæsthesia to be maintained with a light anæsthetic such as nitrous oxide gas and oxygen. No basal anæsthetic should be used in sufficiently large doses to produce full surgical anæsthesia, the exception being the intravenous barbiturates such as pentothal.

The barbiturates are derivatives of barbituric acid; they produce a calm sleep, depress the respiration, but have no depressant action on the circulation; they cause an initial drop in blood-pressure, and they are excreted in the urine. They cause no appreciable change in the healthy liver or kidney; in hepatic and in renal inefficiency their elimination is delayed. The barbiturates enter into a chemical combination with the lecithin and cholesterin of the lipoid tissue in the brain. They interfere with the normal activity of the neurone, the will and the intelligence are abolished, but the patient is not completely isolated from his surroundings, he is capable of responding to external stimuli, but he does not remember. Barbiturates are said to protect against the toxic effects of local anæsthetics.

DRUGS USED IN PREMEDICATION.

Those that Produce Basal Anæsthesia :—

Bromethol—is administered per rectum in a 2½ per cent. solution of distilled water.

Dose : 0.1 cc. per kilogramme body-weight.

Paraldehyde—Dose : 1 drachm per stone body-weight up to 7 drachms. Given per rectum in :—

(1) 10 per cent. solution normal saline.

(2) Olive oil, proportion 1 drachm paraldehyde 1 oz. oil.

(3) 4 oz. starch solution.

Pentothal Sodium (*Lilly*)—Dose : ½ to 1 grm. (15 gr.) in 20 cc. of sterile distilled water, administered by intravenous injection.

Morphia gr. ⅙ or *omnopon* gr. ⅓ may be given one hour before any of these drugs.

THOSE THAT PRODUCE SEDATION :—

	Evening before Operation	One Hour before Operation
Nembutal (Abbott)—capsule : gr. 1½ -	1 capsule ...	2 capsules
Sod. Soneryl—capsule : grm. 0.15 - -	2 capsules ...	2-3 capsules
Seconal (Lilly)—capsule : gr. 1½ - -	2 capsules ...	2 capsules
Luminal - - - - - - -	1—3 gr. tablets	

Morphia ⅙ with hyoscine 1/100, or *omnopon* ⅓ with *scopolamine* 1/150, can be given one hour before operation, preceded by any of the above drugs on the evening before the operation.

Atropine 1/100, fifteen minutes before operation.

CHILDREN.

From twenty-four hours to six months—Pot. brom. gr. 1; chloral hydrate gr. 1; glucose ½ drm; tr. belladonna m. 2; given half-hour before operation.

Over six months—

Nembutal—		*Sod. soneryl*— (by weight)		*Seconal*— (by weight)
6 months—2 years -	gr. ¾	2 stone and under -	½ capsule (0.075 grm.)	½ gr. per 10 lbs. body-weight, up
2— 5 years -	gr. 1	2—3 stone -	½—1 capsule	to a total of
		3—4 stone -	1—1½ capsules	3 gr.
5—10 years -	gr. 1½			
10—16 years -	gr. 2	4—5 stone -	1½—2 capsules	
16 years and upwards -	gr. 3	5—6 stone -	2—2½ capsules	

Syr. of Chloral—

2 to 3 years—1 drm., increasing by ½ drm. up to 3½ drm. at 7 years.

Atropine—6 to 9 months, 1/200—1/100; 9 months and upwards, 1/100—1/80.

Over six years—

Bromethol or paraldehyde may be given, the dose being the same as for adults.

In deciding which of the drugs on this list we will use for our premedication, we must consider the patient, the surgeon, and the operation, and the anæsthetic we propose to give. The average healthy adult raises no problem, and two capsules of nembutal (gr. 3) an hour before operation renders the patient drowsy and comfortable and gives a considerable degree of amnesia. The adolescent is better without morphia preoperatively, though it may be used in small doses after operation. The elderly patient should have one of the slower acting sedatives the night before operation, such as luminal (gr. 1½-2), patients over 70 years are better with omnopon or morphia and atropine rather than scopolamine.

The patient with toxic goitre and the over-anxious patient should be well premedicated, if not already on a sedative, they should be given luminal or one of the other barbiturates for several nights previous to the operation, bromethal (basal dose) preceded by omnopon (gr. ⅓) an hour before, or a barbiturate such as nembutal (gr. 1½) with their morning tea, and omnopon (gr. ⅓) with scopolamine (gr. 1/150)

an hour before operation. The quickly-acting barbiturates should be used with caution or not at all in the toxic case, and the patient suffering from shock : morphia or omnopon is best for these cases. In pulmonary and in cardiac disease the drug should be chosen that will make the patient sedative and throw no extra burden on the respiratory or circulatory systems. In Cæsarean section the danger to the baby must be remembered and morphia avoided, very light premedication with scopolamine or seconal may be used.

Pentothal is a quick and pleasant method of rendering the patient unconscious, but bromethol is more kindly still, for the patient goes to sleep in bed and the post-operative period of sedation is much longer. Pentothal can be given to almost every type of case, it should be given in a 5 per cent. solution. Bromethol is not the anæsthetic of choice for the elderly, the very stout, or the patient with a poor myocardium, neither should it be used where there is impairment of liver or of kidney function. Not more than omnopon gr. $\frac{1}{3}$ or morphia gr. $\frac{1}{6}$ should be given in the immediate post-operative period, and not until the patient is awake and complaining. Paraldehyde is eliminated by the respiratory system, and therefore is better not given to chest cases.

For major operations the patient should be in hospital or nursing home at least thirty-six hours before the operation; they get well rested, their diet is supervised, and plenty of glucose is given. It is better to give too small a dose than to give too large a dose of any drug used for premedication; where an error has been made, coramine or methedrine may be given to counteract the narcotic effect of the particular drug used. It is well to remember that "No anæsthetic agent is safer than the person who administers it."

REFERENCES.

1. HOLLANDER, BERNARD : *Lancet,* 13th Feb., 1932, p. 357.
2. JACKSON and SALISBURY : *Outwitting Our Nerves,* third edition, p. 81.
3. CRICHTON-MILLER, H., M.D. : *Insomnia,* pp. 14, 15.